

Resource Conservation and Pollution Prevention at U.S. Army Garrison Fort Meade, MD: Raising the Bar

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NDIA E2S2 Conference Denver, CO

June 14, 2010



Report Documentation Page				Form Approved OMB No. 0704-0188	
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1. REPORT DATE JUN 2010		2. REPORT TYPE		3. DATES COVERED 00-00-2010 to 00-00-2010	
4. TITLE AND SUBTITLE Resource Conservation and Pollution Prevention at U.S. Army Garrison Fort Meade, MD: Raising the Bar				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) U.S. Army Corps of Engineers,Baltimore District,10 South Howard Street City Crescent Building,Baltimore,MD,21201				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES Presented at the NDIA Environment, Energy Security & Sustainability (E2S2) Symposium & Exhibition held 14-17 June 2010 in Denver, CO.					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 28	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

USACE Baltimore District Planning Division

- Planning and Environmental Services Branch
- Multidisciplinary staff to provide military customers with decision-making products and services
- Specializes in environmental stewardship support



U.S. Army Garrison Fort George G. Meade (FGGM)

- Located in Anne Arundel County, MD, midway between Baltimore and Washington, D.C.
- Approximately 5,000 acres
- Fourth largest workforce among army installations
 - ▶ Approximately 10,000 military personnel and 26,000 civilians employed
 - ▶ Approximately 6,000 family members resident



U.S. Army Garrison Fort George G. Meade (FGGM)

- Utilizes EMS to manage resources
- Committed to a safe, healthy and environmentally friendly working environment
- Prepares innovative resources to manage compliance and stewardship efforts



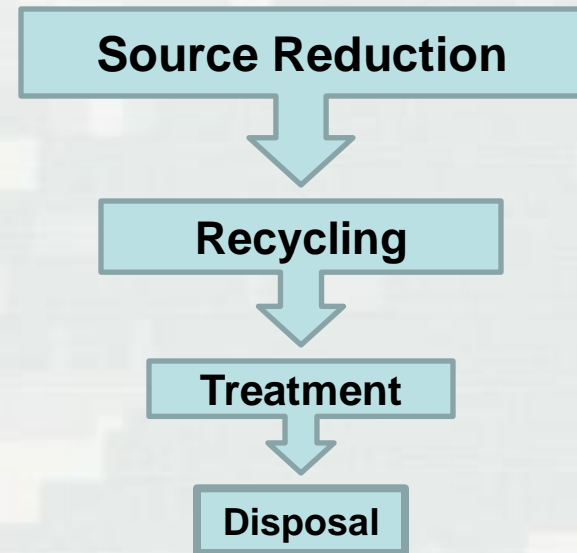
FGGM Pollution Prevention (P2) Plan Goals

- User Friendly
- Update of 2002 Plan
- Compatible with EMS
- Saves money and protects public health and the environment



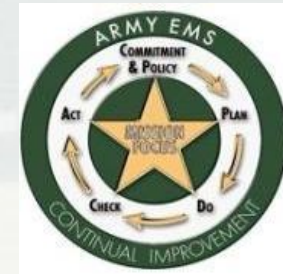
Pollution Prevention (P2)

- “Any activity, process, or mechanism that successfully and cost-effectively *avoids, prevents, or reduces* the sources of pollutant discharges or emissions other than the traditional method of treating pollution at the discharge end of a pipe or stack.”



Pollution Prevention (P2)

- Cost-effective means of meeting environmental objectives by:
 - ▶ Reducing environmental compliance burden
 - ▶ Reducing operational costs
 - ▶ Reducing generation of wastes and pollution
- Essential for Environmental Management System (EMS) implementation
- FGGM has implemented its P2 program since 1997



Project Objective

- Objective: To improve upon FGGM's P2 program
 - ▶ Incorporation of requirements specified in latest Executive Orders and regulations
 - ▶ Assessments of existing P2 initiatives
 - ▶ Identification of potential new P2 initiatives for implementation
 - ▶ Update FGGM's existing P2 Plan



Regulatory P2 Drivers

- Federal Executive Orders (EOs)
 - ▶ EO 13423 (2007) – *Strengthening Federal Environmental, Energy, and Transportation Management*
 - ▶ EO 13508 (2009) – *Chesapeake Bay Protection and Restoration*
 - ▶ EO 13514 (2009) – *Federal Leadership in Environment, Energy, and Economic Performance*
- Energy Independence & Security Act (EISA) of 2007
- Energy Policy Act (EPAAct) of 2005
- Department of Defense (DoD) documents:
 - ▶ Army Regulation 200-1
 - Requires installations to develop and maintain P2 programs
 - ▶ DoD Instruction 4150.7
 - ▶ DoD Instruction 4715.4
 - ▶ DoD Directive 4500.36R



Other P2 Plan Update Drivers

- FGGM EMS Objectives & Targets
 - ▶ Solid waste diversion
 - increase recycling to 50% of general waste by end of FY 2011
 - Increase recycling to 50% of C&D debris by end of FY 2011
 - ▶ Reduce vehicle emissions and fuel consumption
 - Reduce SOV traffic on post from 2009 levels by FY 2012
- Include significant changes since last Plan update:
 - ▶ Privatization of military housing and management
 - ▶ Increase of outsourced services requiring inclusion of tenant activities within P2 fenceline
- Anticipation of significant changes to occur:
 - ▶ Base Realignment and Closure (BRAC) activities
 - ▶ Privatization of utilities (water/wastewater, electric)



Methodology

- Perform regulatory review to identify new P2 drivers
- Benchmark existing P2 Plan with those of other installations
- Conduct preliminary phone surveys
- Conduct field surveys to:
 - ▶ Identify and evaluate existing initiatives being implemented
 - ▶ Identify potential new initiatives
- Develop P2 Opportunity Assessments (P2OAs)
- Review findings with FGGM P2 personnel
- Update P2 Plan



P2 Goals

Media Area	Goal(s)
Chemical Use	<ul style="list-style-type: none"> • Minimize quantities acquired, used, or disposed • Reduce quantities of pesticide applied
Hazardous & Industrial Waste	<ul style="list-style-type: none"> • Continue annual reduction in overall disposal volumes
Solid Waste	<ul style="list-style-type: none"> • Divert 50% of solid waste annually • Divert 50% of construction & demolition (C&D) debris annually • Increase diversion of compostable and organic material from disposal
Air Emissions	<ul style="list-style-type: none"> • Set greenhouse gas (GHG) emissions reduction targets • Reduce vehicle emissions by reducing number of single occupant vehicles passing through installation by 10% • Phase out use of Class II ODS products (i.e., HCFCs)
Water & Wastewater	<ul style="list-style-type: none"> • Reduce potable water consumption by 2% annually (or 26% by FY 2020) • Reduce industrial, landscaping, and agricultural water consumption by 20% • Reduce N, P, and sediment pollution into Bay tributaries

P2 Goals

Media Area	Goal(s)
Energy & Fuels	<ul style="list-style-type: none">• Reduce energy consumption by 15% per gross square foot of building area by FY 2010 (3% annually thereafter)• Install solar hot water equipment to meet 30% of hot water demand• Increase renewable energy consumption to meet at least 50% of total electricity consumed• Reduce petroleum consumption of fleets by 20%• Increase alternative/non-petroleum fuel consumption by 10% annually• Design new buildings for reduction of fossil fuel-generated energy consumption
Green Procurement	<ul style="list-style-type: none">• Increase procurement/use of hybrid or alternative-fueled vehicles• Incorporate energy efficiency policies and criteria for product procurement• Increase procurement of products made from recycled materials• Design new buildings to achieve minimum LEED Silver rating



Shifts in P2 Goals Since 2002

- Previously focused on reduction of hazardous materials and wastes generated
- Shift in focus to sustainability, green buildings, energy and fuels conservation, GHG reduction



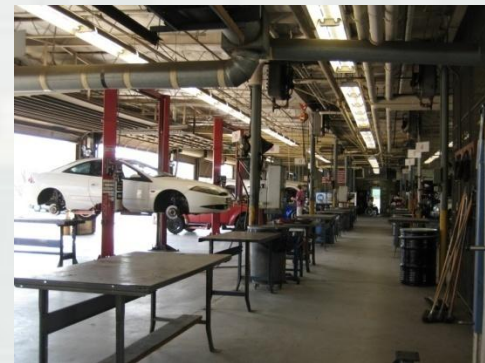
Benchmarking

- Purpose:
 - ▶ Evaluate FGGM's P2 program status compared to other installations
 - ▶ Identify and evaluate any possible new initiatives not currently implemented by FGGM
- Compared existing P2 Plan (2002) to Plans of 3 other installations (2007-08)
- On average, the installations evaluated are implementing approx. 20 initiatives



Surveys

- Conducted preliminary surveys by phone
- Field visits were performed at:
 - ▶ Maintenance Shops
 - ▶ Motor Pools
 - ▶ Fueling Point
 - ▶ Water Treatment Plant
 - ▶ Wastewater Treatment Plant
 - ▶ Pesticides Management Area
 - ▶ Golf Course
 - ▶ Recycling Facility
 - ▶ Hazardous Waste Collection Facility
 - ▶ Defense Reutilization and Marketing Office
 - ▶ Medical Clinic
 - ▶ Forensic Toxicology and Drug Testing Laboratory
- Also met with various DPW division managers:
 - ▶ Energy Manager
 - ▶ Pesticides Manager
 - ▶ Hazardous Waste/Solid Waste/Recycling Manager
 - ▶ Air Program Manager
 - ▶ Green Procurement Manager
 - ▶ Water/Wastewater Manager



Existing P2 Initiatives

■ Hazardous, Industrial, & Solid Wastes

- ▶ Implementation of centralized collection and disposal, including:
 - Collection of household hazardous waste
 - Recycling of: used oil, batteries, scrap tires, fluorescent bulbs, paper, glass, plastic, metals, etc. [via operation of a Qualified Recycling Program]
- ▶ Paint preference of water-based paints over solvent-based paints
- ▶ Use of aqueous-based parts washers, or recycling solvents in any remaining solvent-based parts washers
- ▶ Beneficial reuse of WWT sludge by land application
- ▶ Significant reductions in quantities of pesticides applied - IPM
- ▶ Use of laundry service for soiled rags



Existing P2 Initiatives



■ Water & Wastewater

- ▶ Use of treated effluent from wastewater treatment plant as irrigation water for golf course
- ▶ Incorporation of indoor and outdoor water conservation strategies into building design/retrofits
 - E.g., Use of low-flow plumbing fixtures and appliances
- ▶ Use of buffer zones near waterways downstream of golf course to minimize runoff pollution to Bay tributaries



Existing P2 Initiatives

- Air Emissions

- ▶ Replacement and retrofit of oil-fired boilers with gas-fired units

- Energy & Fuels

- ▶ Acquired 10 electric vehicles for on-site use
- ▶ Use of electric forklifts at some maintenance shops
- ▶ Installation of solar-powered lighting at installation gates

- Green Procurement

- ▶ Increased procurement of products made from recyclable materials



P2 Metrics

- Solid Waste Annual Reports (SWAR) – solid waste, recycling
- Biennial RCRA Hazardous Waste Reports – hazardous waste
- Wastewater Treatment Plant's Raw Flow Data – wastewater generation
- Annual Energy & Water Reporting System (AEWRS) – energy, water consumption
- Annual Air Emissions Inventory/ Certification Report
- Fuel Automated System Enterprise Server



Progress Since 2002

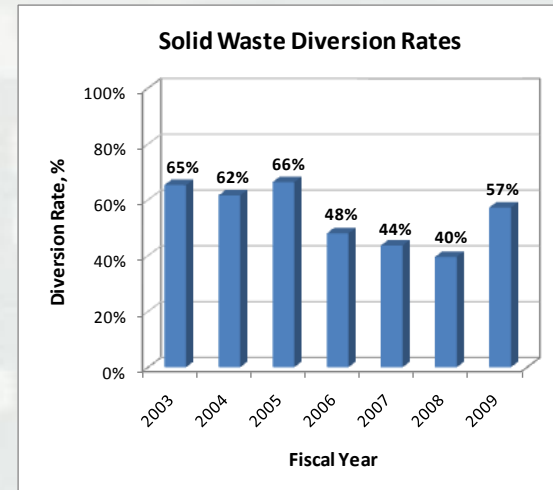
■ Hazardous Wastes

- ▶ Quantities disposed have been decreasing since CY 2001 (disposing 20% of quantity disposed in CY 2001)



■ Solid Wastes

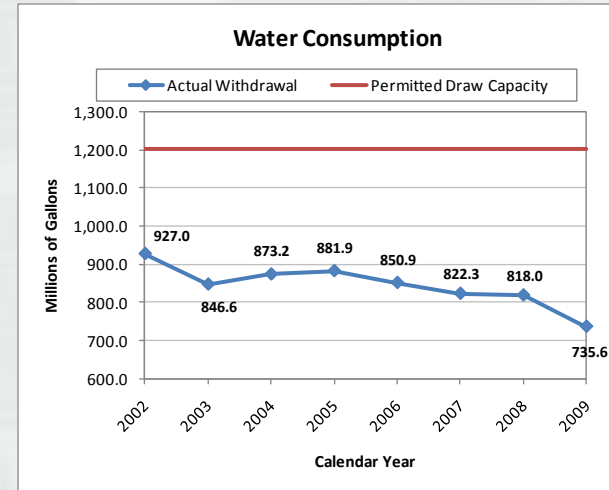
- ▶ Diversion rate has steadily exceeded 40% each FY, with a diversion rate of 57% in FY 2009
 - Includes both MSW and C&D debris



Progress Since 2002

■ Water Consumption

- ▶ Quantities consumed have been decreasing since CY 2005
- ▶ Annual withdrawal quantities are below the permitted draw capacity of 3.3 MGD (1205 MGY)



■ Wastewater Generation

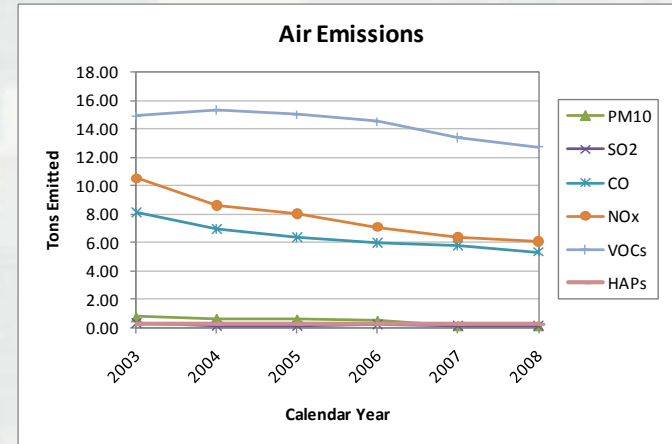
- ▶ Generation decreased between CY 2003 and 2007, increased slightly in CY 2008
- ▶ Plant is also currently meeting more stringent ENR N and P limits



Progress Since 2002

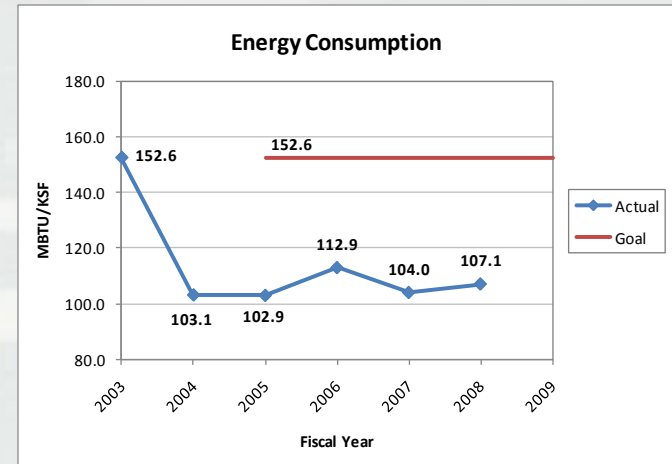
■ Air Emissions

- ▶ Steady decrease in all pollutants since CY 2003



■ Energy Utilization Index

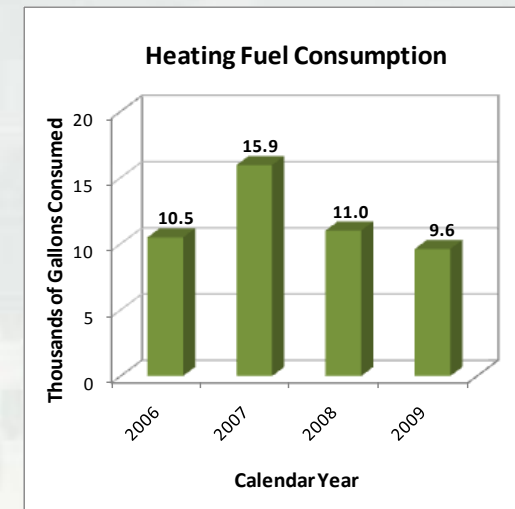
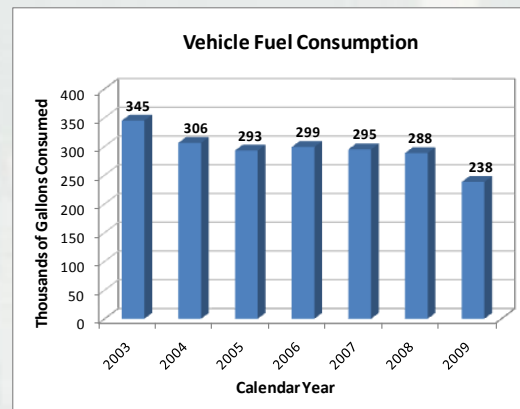
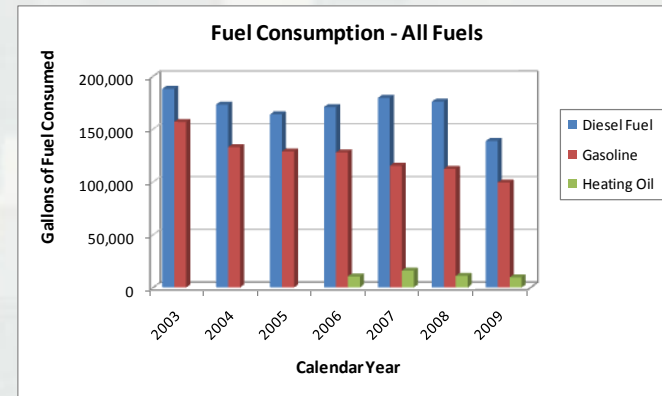
- ▶ Well below goal of 152.6 thousand Btu/square foot of conditioned space



Progress Since 2002

■ Fuel Consumption

- ▶ Tracked by fuel type:
 - Diesel – GSA vehicles only
 - Gasoline – GSA vehicles only
 - Fuel Oil – portable heaters, emergency generators
- ▶ Steady decrease of vehicle fuel use (diesel + gasoline) since CY 2006



Potential New P2 Initiatives

- Hazardous Materials

- ▶ Evaluate substituting less hazardous components in anti-freeze (e.g., propylene glycol)
- ▶ Evaluate use of “green” pesticides
- ▶ Evaluate participation in DLA’s Closed Loop Re-refined Oil Program

- Hazardous, Industrial, & Solid Wastes

- ▶ Phase out use of solvent-based parts washers (or retrofit with solvent-recycling system)
- ▶ Evaluate use of biodegradable oil absorbent materials
- ▶ Establish policies for two-sided/duplex copying and printing
- ▶ Evaluate recycling/crushing of empty propane cylinders
- ▶ Evaluate recycling of styrofoam



Potential New P2 Initiatives

■ Air Emissions

- ▶ Establish inventory of equipment containing ozone-depleting substances (ODS) for tracking phase-out
- ▶ Establish GHG emissions reduction targets

■ Water & Wastewater

- ▶ Evaluate potential upgrades to water distribution system
 - Pending water/wastewater privatization
- ▶ Evaluate potential upgrades to wastewater treatment processes to accommodate biological nutrient removal to reduce chemical use
- ▶ Evaluate potential upgrades to oil/water separators throughout installation and establish formal maintenance and inspection program
- ▶ Establish and implement nutrient management plan



Potential P2 Initiatives

■ Energy & Fuels

- ▶ Consider implementation of bicycle loan program as alternative form of transportation on-site installation
- ▶ Consider implementation of formal carpool/rideshare program
- ▶ Consider use of biodiesel or other alternative fuels where possible
- ▶ Upgrade/retrofit lighting fixtures to be energy-efficient
 - Pending development of FGGM's Energy Conservation Plan

■ Green Procurement

- ▶ Implement the green procurement program that incorporates training, tracking, and reporting elements
- ▶ Increase fleet of vehicles that are electric or utilize alternative fuels
- ▶ Upgrade any equipment currently not Energy Star certified where possible



Summary

- General road map for FGGM
 - ▶ Assessed the P2 program's current status
 - ▶ Developed future program direction and goals
- Selected potential New P2 opportunities, based on:
 - ▶ Efficiency and effectiveness
 - ▶ Availability of future resources
- Incorporated into updated P2 Plan

